

03/29/00
10784 U.S. PTO

03-30-00

A

ASSISTANT COMMISSIONER FOR PATENTS
Washington, D. C. 20231

PATENT APPLICATION
Case Docket No. **199-1255**
Date:

Sir:
Transmitted herewith for filing is the patent application of Inventor(s):
Michael Stoeckle
Krishna Murthy
Devang Desai

For: **METHOD OF INTEGRATING PRODUCT INFORMATION MANAGEMENT WITH VEHICLE DESIGN**

- Enclosed are:
- ☒ 4 sheet(s) of drawings
 - ☒ Assignment and Cover Sheet
 - ☒ Information Disclosure Statement, PTO Form 1449, and Copies of Citations
 - ☐ A certified copy of

10542 U.S. PTO
09/537659
03/29/00

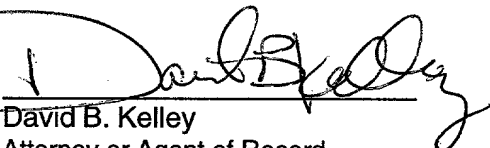
The filing fee has been calculated as shown below for OTHER THAN A SMALL ENTITY:

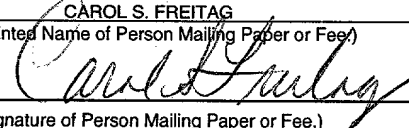
FOR	NO. FILED	NO. EXTRA	RATE	FEE
Basic Fee				\$ 690
Total Claims	16	0	18	\$ 0
Indep Claims	3	0	78	\$ 0
Multiple Dependent Claims(s) Presented	0		260	\$ 0
TOTAL				\$ 690

- ☒ Please charge Deposit Account No. 06-1510 in the amount shown next to the Total.
A duplicate copy of this sheet is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1500. A duplicate copy of this sheet is enclosed.
Any additional filing fees required under 37 CFR 1.16.
Any patent application processing fees under 37 CFR 1.17.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees during the pendency of this application or credit any overpayment to Deposit Account No. 06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1500.
Any patent application processing fees under 37 CFR 1.17.
Any filing fees under 37 CFR 1.16 for presentation of extra claims.

"Express Mail"
Mailing Label Number **EJ459658005US**

Date of Deposit 03-29-00
I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Commissioner of Patent and Trademarks, Washington, D.C. 20231


David B. Kelley
Attorney or Agent of Record
Registration No. 33,718
Ford Global Technologies, Inc.
One Parklane Blvd.,
600 Parklane Towers East
Dearborn, MI 48126

CAROL S. FREITAG
(Printed Name of Person Mailing Paper or Fee)

(Signature of Person Mailing Paper or Fee.)

10 BACKGROUND OF THE INVENTION

The present invention relates generally to vehicle design and, more specifically, to a method of integrating product information management with the design of a vehicle.

Vehicle design, and in particular automotive vehicle design, is a complex process relying on the talents of individuals with specific skills. Vehicle design involves several overlapping phases, including design initiation, development, assessment and verification. Each of these phases relies on information in order to make a decision regarding the design. The information pertinent to the design of a vehicle may be available in various forms, such as individual knowledge based on previous experience. Other forms include newly generated data, or existing data stored within a computer database. For a system as complex as a vehicle, information may be stored in multiple computer databases. Frequently,

5 multiple log-ins to access each database. Furthermore, a user may be unaware of the various databases and of the type of information available therein, to assist in the decision making process.

10 systematic organization and delivery of information from various sources in a useful manner, to assist in decision making. In this example, information management is used in the design of a product, namely a vehicle. In the past, information delivery included
15 the modification of the available information to suit the needs of the user, or to provide expert help to provide the information to the user in a useful manner. Information management has also focused on developing common naming conventions, processes and
20 architectures to facilitate a systematic organization of information and cross-organization information transfer. Advantageously, access to the right information at the right time in the right format and with the right content can improve the quality and
25 efficiency of a process, such as the vehicle design process. Thus, there is a need in the art for a

method of integrating a product information management system with a vehicle design process to provide the user with centralized access to information in a predetermined manner to assist in
5 informed decision-making.

SUMMARY OF THE INVENTION

Accordingly, the present invention is a method of integrating product information management
10 with vehicle design. The method includes the steps of selecting a vehicle program requirement from a library stored in a memory of a computer system, wherein the library is accessed through an information portal on the computer system. The
15 method also includes the steps of selecting an information database containing information related to the design of the vehicle from the library, wherein the information database is accessed through the information portal, and determining if the
20 information from the information database correlates with the program requirement. The method further includes the steps of using the information from the information database in the design of the vehicle, if the information from the information database
25 correlates with the program requirement.

000000-000000

006220-65922500

One advantage of the present invention is that a method of integrating product information management with vehicle design is provided that links together various existing databases, system
5 infrastructure and information sources to provide a user with access to information contained therein to assist the user in informed decision making. Another advantage of the present invention is that the method uses an information portal approach to provide a user
10 with access to information in its original format and content. Still another advantage of the present invention is that the method provides for customization of the information portal by the user for a specific process. A further advantage of the
15 present invention is that the method utilizes a process driven approach to supply information within an information portal window.

Other features and advantages of the present invention will be readily appreciated, as the
20 same becomes better understood, after reading the subsequent description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

25 FIG. 1 is a block diagram of a system which may be utilized with a method of integrating product

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.32	0.47	0	1
Education	12.8	1.5	9	16
Income	28,500	12,000	10,000	50,000
Health Status	0.65	0.48	0	1
Employment Status	0.72	0.45	0	1
Life Satisfaction	4.2	1.8	1	7
Depression Score	1.5	1.2	0	4
Stress Level	3.8	1.5	1	6
Quality of Life	5.5	2.0	2	8
Physical Health	0.85	0.35	0	1
Mental Health	0.78	0.42	0	1
Social Support	0.62	0.49	0	1
Life Expectancy	78.5	5.2	65	90
Healthcare Costs	1,200	400	500	2,000
Chronic Disease	0.25	0.43	0	1
Smoking Status	0.18	0.38	0	1
Alcohol Consumption	0.12	0.33	0	1
Exercise Frequency	0.35	0.48	0	1
Diet Quality	0.68	0.46	0	1
Sleep Quality	0.75	0.44	0	1
Work-Life Balance	0.55	0.50	0	1
Financial Stability	0.60	0.49	0	1
Community Involvement	0.40	0.50	0	1
Personal Growth	0.50	0.50	0	1
Relationship Satisfaction	0.65	0.48	0	1
Parenting Satisfaction	0.70	0.45	0	1
Overall Well-being	6.5	2.5	2	10

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	22	55
Gender	0.45	0.50	0	1
Marital Status	0.60	0.49	0	1
Education	12.5	1.5	9	16
Income	25000	15000	10000	50000
Health	0.75	0.43	0	1
Smoking	0.30	0.46	0	1
Drinking	0.20	0.40	0	1
Exercise	0.10	0.30	0	1
Stress	0.50	0.50	0	1
Sleep	0.60	0.49	0	1
Appetite	0.70	0.46	0	1
Mood	0.50	0.50	0	1
Energy	0.60	0.49	0	1
Concentration	0.70	0.46	0	1
Memory	0.80	0.39	0	1
Emotion	0.60	0.49	0	1
Behavior	0.70	0.46	0	1
Thought	0.80	0.39	0	1
Feeling	0.70	0.46	0	1
Perception	0.80	0.39	0	1
Attention	0.70	0.46	0	1
Intuition	0.60	0.49	0	1
Imagination	0.50	0.50	0	1
Reasoning	0.70	0.46	0	1
Logic	0.80	0.39	0	1
Analysis	0.70	0.46	0	1
Synthesis	0.60	0.49	0	1
Evaluation	0.70	0.46	0	1
Comparison	0.80	0.39	0	1
Classification	0.70	0.46	0	1
Organization	0.60	0.49	0	1
Planning	0.70	0.46	0	1
Problem Solving	0.80	0.39	0	1
Decision Making	0.70	0.46	0	1
Communication	0.60	0.49	0	1
Interpersonal Skills	0.70	0.46	0	1
Teamwork	0.80	0.39	0	1
Leadership	0.70	0.46	0	1
Management	0.60	0.49	0	1
Coordination	0.70	0.46	0	1
Organization	0.80	0.39	0	1
Planning	0.70	0.46	0	1
Problem Solving	0.80	0.39	0	1
Decision Making	0.70	0.46	0	1
Communication	0.60	0.49	0	1
Interpersonal Skills	0.70	0.46	0	1
Teamwork	0.80	0.39	0	1
Leadership	0.70	0.46	0	1
Management	0.60	0.49	0	1
Coordination	0.70	0.46	0	1
Organization	0.80	0.39	0	1
Planning	0.70	0.46	0	1
Problem Solving	0.80	0.39	0	1
Decision Making	0.70	0.46	0	1
Communication	0.60	0.49	0	1
Interpersonal Skills	0.70	0.46	0	1
Teamwork	0.80	0.39	0	1
Leadership	0.70	0.46	0	1
Management	0.60	0.49	0	1
Coordination	0.70	0.46	0	1
Organization	0.80	0.39	0	1
Planning	0.70	0.46	0	1
Problem Solving	0.80	0.39	0	1
Decision Making	0.70	0.46	0	1
Communication	0.60	0.49	0	1
Interpersonal Skills	0.70	0.46	0	1
Teamwork	0.80	0.39	0	1
Leadership	0.70	0.46	0	1
Management	0.60	0.49	0	1
Coordination	0.70	0.46	0	1
Organization	0.80	0.39	0	1
Planning	0.70	0.46	0	1
Problem Solving	0.80	0.39	0	1
Decision Making	0.70	0.46	0	1
Communication	0.60	0.49	0	1
Interpersonal Skills	0.70	0.46	0	1
Teamwork	0.80	0.39	0	1
Leadership	0.70	0.46	0	1
Management	0.60	0.49	0	1
Coordination	0.70	0.46	0	1
Organization	0.80	0.39	0	1
Planning	0.70	0.46	0</	

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.65	0.48	0	1
Education	12.5	1.8	9	16
Income	25,000	15,000	10,000	50,000
Health Status	0.72	0.45	0	1
Employment Status	0.85	0.35	0	1
Life Satisfaction	4.2	1.5	1	7
Depression Score	2.1	1.2	0	4
Stress Level	3.8	1.8	1	6
Quality of Life	5.5	2.0	2	8
Resilience Score	3.5	1.5	1	6
Optimism Level	4.5	1.8	2	7
Life Purpose	5.0	2.2	2	8
Meaning in Life	5.2	2.1	2	8
Personal Growth	4.8	2.0	2	8
Life Satisfaction (Control)	4.3	1.6	1	7
Depression Score (Control)	2.2	1.3	0	4
Stress Level (Control)	3.9	1.9	1	6
Quality of Life (Control)	5.6	2.1	2	8
Resilience Score (Control)	3.6	1.6	1	6
Optimism Level (Control)	4.6	1.9	2	7
Life Purpose (Control)	5.1	2.3	2	8
Meaning in Life (Control)	5.3	2.2	2	8
Personal Growth (Control)	4.9	2.1	2	8

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.65	0.48	0	1
Education	12.5	1.8	9	16
Income	25,000	15,000	10,000	50,000
Health Status	0.72	0.45	0	1
Employment Status	0.85	0.35	0	1
Life Satisfaction	4.2	1.5	1	7
Depression Score	2.1	1.2	0	4
Stress Level	3.8	1.8	1	6
Quality of Life	5.5	2.0	2	8
Resilience Score	3.5	1.5	1	6
Optimism Level	4.5	1.8	2	7
Life Purpose	5.0	2.2	2	8
Meaning in Life	5.2	2.1	2	8
Personal Growth	4.8	2.0	2	8
Life Satisfaction (Control)	4.3	1.6	1	7
Depression Score (Control)	2.2	1.3	0	4
Stress Level (Control)	3.9	1.9	1	6
Quality of Life (Control)	5.6	2.1	2	8
Resilience Score (Control)	3.6	1.6	1	6
Optimism Level (Control)	4.6	1.9	2	7
Life Purpose (Control)	5.1	2.3	2	8
Meaning in Life (Control)	5.3	2.2	2	8
Personal Growth (Control)	4.9	2.1	2	8

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.65	0.48	0	1
Education	12.5	1.8	9	16
Income	25,000	15,000	10,000	50,000
Health Status	0.72	0.45	0	1
Employment Status	0.85	0.35	0	1
Life Satisfaction	4.2	1.5	1	7
Depression Score	2.1	1.2	0	4
Stress Level	3.8	1.8	1	6
Quality of Life	5.5	2.0	2	8
Resilience Score	3.5	1.5	1	6
Optimism Level	4.5	1.8	2	7
Life Purpose	5.0	2.2	2	8
Meaning in Life	5.2	2.1	2	8
Personal Growth	4.8	2.0	2	8
Life Satisfaction (Control)	4.3	1.6	1	7
Depression Score (Control)	2.2	1.3	0	4
Stress Level (Control)	3.9	1.9	1	6
Quality of Life (Control)	5.6	2.1	2	8
Resilience Score (Control)	3.6	1.6	1	6
Optimism Level (Control)	4.6	1.9	2	7
Life Purpose (Control)	5.1	2.3	2	8
Meaning in Life (Control)	5.3	2.2	2	8
Personal Growth (Control)	4.9	2.1	2	8

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.65	0.48	0	1
Education	12.5	1.8	9	16
Income	25,000	15,000	10,000	50,000
Health Status	0.72	0.45	0	1
Employment Status	0.85	0.35	0	1
Life Satisfaction	4.2	1.5	1	7
Depression Score	2.1	1.2	0	4
Stress Level	3.8	1.8	1	6
Quality of Life	5.5	2.0	2	8
Resilience Score	3.5	1.5	1	6
Optimism Level	4.5	1.8	2	7
Life Purpose	5.0	2.2	2	8
Meaning in Life	5.2	2.1	2	8
Personal Growth	4.8	2.0	2	8
Life Satisfaction (Control)	4.3	1.6	1	7
Depression Score (Control)	2.2	1.3	0	4
Stress Level (Control)	3.9	1.9	1	6
Quality of Life (Control)	5.6	2.1	2	8
Resilience Score (Control)	3.6	1.6	1	6
Optimism Level (Control)	4.6	1.9	2	7
Life Purpose (Control)	5.1	2.3	2	8
Meaning in Life (Control)	5.3	2.2	2	8
Personal Growth (Control)	4.9	2.1	2	8

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	21	55
Gender	0.48	0.50	0	1
Marital Status	0.65	0.48	0	1
Education	12.5	1.8	9	16
Income	25,000	15,000	10,000	50,000
Health Status	0.72	0.45	0	1
Employment Status	0.85	0.35	0	1
Life Satisfaction	4.2	1.5	1	7
Depression Score	2.1	1.2	0	4
Stress Level	3.8	1.8	1	6
Quality of Life	5.5	2.0	2	8
Resilience Score	3.5	1.5	1	6
Optimism Level	4.5	1.8	2	7
Life Purpose	5.0	2.2	2	8
Meaning in Life	5.2	2.1	2	8
Personal Growth	4.8	2.0	2	8
Life Satisfaction (Control)	4.3	1.6	1	7
Depression Score (Control)	2.2	1.3	0	4
Stress Level (Control)	3.9	1.9	1	6
Quality of Life (Control)	5.6	2.1	2	8
Resilience Score (Control)	3.6	1.6	1	6
Optimism Level (Control)	4.6	1.9	2	7
Life Purpose (Control)	5.1	2.3	2	8
Meaning in Life (Control)	5.3	2.2	2	8
Personal Growth (Control)	4.9	2.1	2	8

product information management with vehicle design, according to the present invention, are illustrated graphically. The tools 100 include a knowledge-based engineering library 112 stored on an electronic storage device (not shown) that is operatively connected to a computer system 122 to be described. The knowledge-based engineering library 112 is a database of sub-libraries containing an electronic representation of data including various experts' knowledge of information relevant to the design of a vehicle 10 to be described. The knowledge-based engineering library 112 may include information such as design, assembly and manufacturing rules and guidelines. The knowledge-based engineering library 112 may also contain data in electronic form regarding various types of vehicle subsystems. The knowledge-based engineering library 112 may further contain predetermined product assumptions regarding the vehicle 10 to be designed, such as model year, style, or production volume.

The knowledge-based engineering library 112 may include a sub-library, such as a component parts library of particular component parts used on a vehicle. The component parts sub-library may contain information such as a parametric solid model of a particular component part, as well as parameters

5 The tools 100 also include a vehicle library 114 stored on the electronic storage device. The vehicle library 114 is an electrical representation of a vehicle model or a portion thereof. Advantageously, the vehicle library 114 may contain a parametric solid model of an exterior portion of a particular vehicle 10. In this example, the vehicle library 114 may include a parametric model of an exterior body portion of the vehicle 10. Also, the vehicle library 114 may contain parameters defining various vehicles and vehicle system characteristics, such as interior size and vehicle body style. It should be appreciated that the vehicle library 114 may be a sub-library of the knowledge-based engineering library 112.

20 The tools 100 may also include various
computer-aided design (CAD) tools 116, which can be
used by the method, to be described. These design
tools 116 may include solid modeling, visualization
and parametric design techniques. Solid modeling, for
25 example, takes electronically stored vehicle model
data from the vehicle library 114 and standard

component parts data from the knowledge-based engineering library 112 and builds complex geometry for part-to-part or full assembly analysis. Several modeling programs are commercially available and
5 generally known to those skilled in the art.

The parametric design technique is used in the electronic construction of vehicle geometry within the computer system 122, for designing the vehicle 10 or related component part. As a
10 particular dimension or parameter is modified, the computer system 122 is instructed to regenerate a new vehicle or component part geometry.

The tools 100 also include various computer-aided engineering (CAE) analysis tools 118.
15 One example of a CAE analysis tool 118 is computational fluid dynamics (CFD). Another example of a CAE analysis tool 118 is finite element analysis (FEA). Still another example of a CAE analysis tool 118 is an ergonomic study. Several software programs
20 are commercially available to perform these analyses and are generally known to those skilled in the art.

The tools 100 further include the computer system 122, as is known in the art, to implement a method 120, according to the present invention to be
25 described, of integrating product information management with vehicle design. The computer system

000000-000000

5 In this example, the information is displayed on the video terminal 124b in a series of screens, also referred to as a browser. Selection and control of the information within a screen can be achieved by the user 126, via a user interactive
10 device 124c, such as a keyboard or a mouse. The user 126 inputs a set of parameters or a set of instructions into the computer system 122 when prompted to do so. The set of parameters or the set of instructions may be product specific, wherein
15 other data and instructions non-specific to the product may already be stored in the memory 124a.

The computer system 122 utilizes the set of information or instructions from the user 126, and
25 any other information regarding related vehicle systems and information from the libraries 112, 114,

design tools 116 and analysis tools 118, for a method 120, according to the present invention discussed in detail subsequently, of providing information to users that enhances informed decision making in the design of the vehicle 10.

Advantageously, the computer implemented method of integrating product information management with vehicle design, to be described, combines all of the foregoing to provide an efficient, flexible, rapid tool for making an informed decision regarding the design of the vehicle 10. Further, an informed decision regarding the vehicle design 128 is an output of the method 120 and the vehicle design 128 is available for further analysis and study.

Referring to FIG. 2, a vehicle 10, and in particular an automotive vehicle, is illustrated. The vehicle 10 includes a vehicle frame, generally indicated at 12, which supports a vehicle body 16. The vehicle 10 also includes a front axle (not shown) and rear axle (not shown) disposed in a spaced relationship to one another and extending substantially transverse to a longitudinal axis of the vehicle 10. It should be appreciated that wheels 14, as is known in the art, are operatively mounted to the front axle and rear axle, for rolling engagement with a surface such as a road.

The vehicle 10 also includes a vehicle body 16 which defines the shape of the vehicle 10, as is known in the art, and includes components typically associated with the vehicle body 16. The vehicle body 16 is supported by the frame 12. The vehicle body 16 includes structural members 17 which form a load bearing surface for the vehicle 10. The vehicle body 16 includes a plurality of generally planar interconnected body panels 18 secured thereto using a conventional means such as welding or fastening. Advantageously, the body panels 18 further define an aesthetically pleasing shape of the vehicle 10. The vehicle body 16 may include a windshield 20, and other windows 22, as is known in the art.

The vehicle body 16 defines a front storage compartment 24 referred to as the engine compartment, which forms the general shape of the front of the vehicle 10. The engine compartment houses the powertrain system (not shown) for the vehicle 10. The vehicle body 16 further defines an occupant compartment 26 to accommodate vehicle occupants (not shown). The occupant compartment 26 includes a number of seats (not shown) for the occupants and control mechanisms (not shown) to operate the vehicle 10. The vehicle body 16 also defines a rear storage

[illegible][illegible][illegible]

The methodology begins in bubble 200 and advances to block 205. Advantageously, the method utilizes a web-enabled portal process to provide the user 126 with information in its original format and content to use in the design of the vehicle 10. As is known in the art, an information portal is a web site that provides a particular audience with access to diverse sets of information organized in a specific manner. It should be appreciated that the information portal may contain a series of screens that leads the user 126 step by step through a decision making process and provides the appropriate information to the user 126 at the right time. The user 126 can be linked with other experts through an information portal screen to assist in the underlying engineering process. In this example, the information portal is organized into screens that provide the user 126 with information to make an informed decision relating to the vehicle design 128 of the vehicle 10. Examples of the type of information relevant to vehicle design 128 include warranty, product design data and manufacturing data. Advantageously, the method utilizes a web-based portal process to provide the user 126 with information in its original format and content to use in the vehicle design 128 of the vehicle 10.

00662E0-6592E560

Advantageously, the information portal can also be customized for a particular user 126. For example, different users 126 may utilize the same information databases within the knowledge-based engineering library 112, but at different stages within the vehicle design process. If a user 126 repeatedly performs a set of operations, a macro-type customization, as is known in the art, can be developed and the information portal can be personalized to present only the resulting information, in order to improve data processing and overall business efficiency.

In block 205, the user 126 determines specific program requirements related to the vehicle design 128 of the vehicle 10 and selects an information database for decision making purposes from an information portal displayed on the video terminal 124b. An example of a program requirement is information maintained within the knowledge-based library 112 regarding the type of vehicle 10 to be designed, such as passenger car or truck. Another example of a program requirement is anticipated production volume, or vehicle body style. Still another example of a program requirement is a warranty target. Advantageously, the user 126 may select a program requirement from an information

portal screen displayed on the display terminal 124b containing a list of program requirements. The user 126 may also select an information database related to making an informed decision regarding the vehicle 5 design 128 of the vehicle 10 from the information portal screen. The information database is a compilation of existing information maintained within a database in the knowledge-based engineering library 112. For example, the information may be existing 10 data from a previously conducted vehicle test procedure. The methodology advances to diamond 210.

In diamond 210, the methodology determines if the information from the information database correlates with the program requirements. For 15 example, the information may be compared to the program requirements to determine if there is a change in a component part that would affect the use of the information in making an informed decision regarding the vehicle design 128. The information may 20 also be compared to the program requirements to determine if there is a design or manufacturing process change that would affect the use of the information. The information may further be compared to the program requirements to determine if there is 25 a field issue or a change in customer expectation that would affect its use. If the information does

[illegible][illegible][illegible][illegible]

000000-000000

In diamond 240, the user 126 determines through the additional information displayed on the information portal whether to generate new information pertaining to the vehicle design 128 of the vehicle 10 based on the available additional information. For example, the user 126 may decide to perform a task such as a laboratory test, since existing test information or a portion thereof is not reusable. If the user 126 decides to generate new information, the methodology advances to block 245. In block 245, the user 126 generates new information. For example, the user 126 may decide whether to perform a test on either an actual vehicle or in a laboratory. The methodology advances to bubble 250 and ends. Returning to diamond 240, if the user 126 determines not to generate new information, the methodology advances to bubble 250 and ends.

Referring to FIG. 4, another embodiment, according to the present invention, of a method of integrating product information management with vehicle design is illustrated. In this embodiment, the method is utilized for making a decision regarding existing verified information, for use in the vehicle design 128 of the vehicle 10. Advantageously, an information verification process determines if previously verified information or data

durability information correlates with the program requirements. For example, the existing durability information may be in the form of test data. If the existing durability information satisfies the program requirements, the methodology advances to block 315.

In block 315, the user 126 reuses the verified durability information in informed decision making regarding the vehicle design 128 of the vehicle 10 since it satisfies the specified program requirements. The methodology advances to bubble 380 and ends.

Returning to diamond 310, if the existing durability information does not correlate with the specific program requirements, the methodology advances to block 320. In block 320, the user 126 determines through the information portal screen if additional information is available that may influence the reuse of existing durability information in the verification process. For example, the user 126 may locate a durability target for a subsystem of the vehicle 10. The methodology advances to diamond 325.

In diamond 325, the user 126 determines through the information portal if a portion of the existing durability information may be reused based on the additional information. If a portion of the

000000-000000-000000

durability information may not be reused, the methodology advances to block 330. In block 330, the user 126 generates new information. For example, the user 126 may perform a test to generate new data for use in the vehicle design 128 of the vehicle 10. The methodology advances to block 335 and the user 126, through the information portal screen, selects the type of test to be performed to generate new data. One example of a test is an evaluation in a laboratory using a test stand. Another example of a test is an on-road evaluation using a vehicle 10. The methodology advances to block 340.

In block 340, the selected test is performed to generate new data. The methodology advances to block 345. In block 345, the methodology uses the newly generated information in the vehicle design 128 of the vehicle 10. The methodology advances to bubble 380 and ends.

Returning to diamond 325, if a portion of the information does satisfy a predetermined requirement, the methodology advances to diamond 350. In diamond 350, the user 126 determines through the information provided through the information portal if conditions are known under which the existing durability data was generated. Advantageously, additional information from still another information

analysis 118 meets a predetermined criteria. If confidence in the results of the CAE analysis 118 does not meet a predetermined criteria, the methodology advances to diamond 330 and continues.

5 Returning to diamond 370, if confidence in the results of the CAE analysis 118 does meet a predetermined criteria, the methodology advances to block 375. In block 375, the methodology uses the results of the CAE analysis 118 and a portion of the

10 verification information in informed decision-making regarding the vehicle design 128 of the vehicle 10. The methodology advances to bubble 380 and ends.

The present invention has been described in an illustrative manner. It is to be understood that

15 the terminology, which has been used, is intended to be in the nature of words of description rather than of limitation.

Many modifications and variations of the present invention are possible in light of the above

20 teachings. Therefore, within the scope of the appended claims, the present invention may be practiced other than as specifically described.

WHAT IS CLAIMED IS:

1. A method of integrating product information management with vehicle design, said method comprising the steps of

5 selecting a vehicle program requirement from a library stored in a memory of a computer system, wherein the library is accessed through an information portal on the computer system;

10 selecting an information database containing information related to the design of the vehicle from the library, wherein the information database is accessed through the information portal;

15 determining if the information from the information database correlates with the program requirement; and

using the information from the information database in the design of the vehicle, if the information from the information database correlates with the program requirement.

20

2. A method as set forth in claim 1 including the step of selecting through the information portal additional information for determining if the information from the information database correlates with the program requirement, if

25

[illegible]

Variable	Mean	SD	Min	Max
Age	34.2	10.5	18	65
Gender	0.52	0.50	0	1
Marital status	0.65	0.48	0	1
Education	12.5	1.2	9	16
Income	15.2	3.5	10	25
Occupation	1.2	0.8	0	2
Health status	1.8	0.9	1	3
Life satisfaction	4.2	1.5	1	7
Stress level	2.5	1.2	1	4
Depression	1.5	0.8	0	3
Loneliness	2.2	1.0	1	4
Self-esteem	3.8	1.2	1	5
Resilience	3.5	1.1	1	5
Optimism	4.0	1.3	1	5
Gratitude	3.2	1.0	1	4
Forgiveness	3.0	1.1	1	4
Empathy	3.5	1.2	1	5
Compassion	3.3	1.1	1	4
Kindness	3.1	1.0	1	4
Generosity	3.4	1.1	1	4
Patience	3.6	1.2	1	5
Humility	3.7	1.3	1	5
Modesty	3.8	1.4	1	5
Shyness	2.8	1.0	1	4
Introversion	2.5	0.9	1	4
Extroversion	2.2	0.8	1	4
Social skills	2.0	0.7	1	3
Communication	1.8	0.6	1	3
Interpersonal	1.6	0.5	1	3
Relationships	1.4	0.4	1	3
Family	1.2	0.3	1	3
Friends	1.0	0.2	1	3
Community	0.8	0.2	1	3
Society	0.6	0.1	1	3
World	0.4	0.1	1	3
Universe	0.2	0.1	1	3
Nature	0.1	0.1	1	3
Life	0.0	0.0	1	3
Death	0.0	0.0	1	3
Religion	0.0	0.0	1	3
Philosophy	0.0	0.0	1	3
Art	0.0	0.0	1	3
Science	0.0	0.0	1	3
Technology	0.0	0.0	1	3
Environment	0.0	0.0	1	3
Climate	0.0	0.0	1	3
Weather	0.0	0.0	1	3
Seasons	0.0	0.0	1	3
Time	0.0	0.0	1	3
Space	0.0	0.0	1	3
Energy	0.0	0.0	1	3
Power	0.0	0.0	1	3
Force	0.0	0.0	1	3
Motion	0.0	0.0	1	3
Change	0.0	0.0	1	3
Growth	0.0	0.0	1	3
Development	0.0	0.0	1	3
Progress	0.0	0.0	1	3
Success	0.0	0.0	1	3
Failure	0.0	0.0	1	3
Victory	0.0	0.0	1	3
Defeat	0.0	0.0	1	3
Triumph	0.0	0.0	1	3
Disaster	0.0	0.0	1	3
Calamity	0.0	0.0	1	3
Tragedy	0.0	0.0	1	3
Misfortune	0.0	0.0	1	3
Adversity	0.0	0.0	1	3
Hardship	0.0	0.0	1	3
Struggle	0.0	0.0	1	3
Conflict	0.0	0.0	1	3
War	0.0	0.0	1	3
Peace	0.0	0.0	1	3
Harmony	0.0	0.0	1	3
Balance	0.0	0.0	1	3
Equilibrium	0.0	0.0	1	3
Stability	0.0	0.0	1	3
Security	0.0	0.0	1	3
Safety	0.0	0.0	1	3
Health	0.0	0.0	1	3
Wellness	0.0	0.0	1	3
Longevity	0.0	0.0	1	3
Immortality	0.0	0.0	1	3
Rebirth	0.0	0.0	1	3
Resurrection	0.0	0.0	1	3
Ascension	0.0	0.0	1	3
Transcendence</				

Variable	Mean	SD	Min	Max
Age	34.2	10.5	18	65
Gender	0.52	0.50	0	1
Marital status	0.65	0.48	0	1
Education	12.5	1.2	9	16
Income	15.2	3.5	10	25
Occupation	1.2	0.8	0	2
Health status	1.8	0.9	1	3
Life satisfaction	4.2	1.5	1	7
Stress level	2.5	1.2	1	4
Depression	1.5	0.8	0	3
Loneliness	2.2	1.0	1	4
Self-esteem	3.8	1.2	1	5
Resilience	3.5	1.1	1	5
Optimism	4.0	1.3	1	5
Gratitude	3.2	1.0	1	4
Forgiveness	3.0	1.1	1	4
Empathy	3.5	1.2	1	5
Compassion	3.3	1.1	1	4
Kindness	3.1	1.0	1	4
Generosity	3.4	1.1	1	4
Patience	3.6	1.2	1	5
Humility	3.7	1.3	1	5
Modesty	3.8	1.4	1	5
Shyness	2.8	1.0	1	4
Introversion	2.5	0.9	1	4
Extroversion	2.2	0.8	1	4
Social skills	2.0	0.7	1	4
Communication	1.8	0.6	1	4
Interpersonal	1.5	0.5	1	4
Relationships	1.2	0.4	1	4
Family	1.0	0.3	1	4
Friends	0.8	0.2	1	4
Community	0.5	0.1	1	4
Society	0.3	0.1	1	4
World	0.1	0.0	1	4
Universe	0.0	0.0	1	4
God	0.0	0.0	1	4
Religion	0.0	0.0	1	4
Philosophy	0.0	0.0	1	4
Science	0.0	0.0	1	4
Technology	0.0	0.0	1	4
Environment	0.0	0.0	1	4
Nature	0.0	0.0	1	4
Life	0.0	0.0	1	4
Death	0.0	0.0	1	4
Afterlife	0.0	0.0	1	4
Heaven	0.0	0.0	1	4
Hell	0.0	0.0	1	4
Paradise	0.0	0.0	1	4
Hellfire	0.0	0.0	1	4
Angels	0.0	0.0	1	4
Devils	0.0	0.0	1	4
Spirits	0.0	0.0	1	4
Demons	0.0	0.0	1	4
Witches	0.0	0.0	1	4
Magicians	0.0	0.0	1	4
Warlocks	0.0	0.0	1	4
Wizards	0.0	0.0	1	4
Enchanters	0.0	0.0	1	4
Summoners	0.0	0.0	1	4
Conjurers	0.0	0.0	1	4
Illusionists	0.0	0.0	1	4
Transmuters	0.0	0.0	1	4
Alchemists	0.0	0.0	1	4
Hermeticists	0.0	0.0	1	4
Occultists	0.0	0.0	1	4
Magicians	0.0	0.0	1	4
Wizards	0.0	0.0	1	4
Enchanters	0.0	0.0	1	4
Summoners	0.0	0.0	1	4
Conjurers	0.0	0.0	1	4
Illusionists	0.0	0.0	1	4
Transmuters	0.0	0.0	1	4
Alchemists	0.0	0.0	1	4
Hermeticists	0.0	0.0	1	4
Occultists	0.0	0.0	1	4
Magicians	0.0	0.0	1	4
Wizards	0.0	0.0	1	4
Enchanters	0.0	0.0	1	4
Summoners	0.0	0.0	1	4
Conjurers	0.0	0.0	1	4
Illusionists	0.0	0.0	1	4
Transmuters	0.0	0.0	1	4
Alchemists	0.0	0.0	1	4
Hermeticists	0.0	0.0	1	4
Occultists	0.0			

Variable	Mean	SD	Min	Max
Age	34.2	10.5	18	65
Gender	0.52	0.50	0	1
Marital status	0.65	0.48	0	1
Education	12.5	1.2	9	16
Income	15.2	3.5	10	25
Occupation	1.2	0.8	0	2
Health status	1.8	0.9	1	3
Life satisfaction	4.2	1.5	1	7
Stress level	2.5	1.2	1	4
Depression	1.5	0.8	0	3
Loneliness	2.2	1.0	1	4
Self-esteem	3.8	1.2	1	5
Resilience	3.5	1.1	1	5
Optimism	4.0	1.3	1	5
Gratitude	3.2	1.0	1	4
Forgiveness	3.0	1.1	1	4
Empathy	3.5	1.2	1	5
Prosocial behavior	3.8	1.3	1	5
Life purpose	3.5	1.1	1	5
Meaning in life	3.2	1.0	1	4
Existential well-being	3.0	1.1	1	4
Overall well-being	3.5	1.2	1	5

Variable	Mean	SD	Min	Max
Age	34.2	10.5	18	65
Gender	0.52	0.50	0	1
Marital status	0.65	0.48	0	1
Education	12.5	1.2	9	16
Income	15.2	3.5	10	25
Occupation	1.2	0.8	0	2
Health status	1.8	0.9	1	3
Life satisfaction	4.2	1.5	1	7
Stress level	2.5	1.2	1	4
Depression	1.5	0.8	0	3
Loneliness	2.2	1.0	1	4
Self-esteem	3.8	1.2	1	5
Resilience	3.5	1.1	1	5
Optimism	4.0	1.3	1	5
Gratitude	3.2	1.0	1	4
Forgiveness	3.0	1.1	1	4
Empathy	3.5	1.2	1	5
Prosocial behavior	3.8	1.3	1	5
Life purpose	3.5	1.1	1	5
Meaning in life	3.2	1.0	1	4
Existential well-being	3.0	1.1	1	4
Overall well-being	3.5	1.2	1	5

the information database does not correlate with the program requirement;

determining if a portion of the information from the information database correlates with the program requirement based on the additional information; and

using the portion of the information from the information database that correlates with the program requirement in the design of the vehicle.

10

8. A method as set forth in claim 7 including the step of selecting through the information portal additional information regarding the design of the vehicle.

15

9. A method as set forth in claim 8 including the step of using the additional information to determine whether to generate new information for use in the design of the vehicle and generating new information if determined that the new information should be generated.

10. A method of integrating product information management with vehicle design to verify existing information, using a computer system having

[illegible][illegible][illegible][illegible][illegible]

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---

Variable	Mean	Standard Deviation	Minimum	Maximum
Age	34.5	10.2	22	55
Gender	0.5	0.5	0	1
Marital Status	0.7	0.5	0	1
Education	12.5	1.5	10	16
Income	3500	1500	1000	8000
Health	0.8	0.3	0	1
Smoking	0.2	0.4	0	1
Alcohol	0.1	0.3	0	1
Exercise	0.3	0.5	0	1
Stress	0.6	0.4	0	1
Sleep	0.7	0.3	0	1
Work	0.8	0.2	0	1
Family	0.9	0.1	0	1
Friends	0.7	0.4	0	1
Community	0.6	0.3	0	1
Religion	0.5	0.5	0	1
Politics	0.4	0.4	0	1
Art	0.3	0.5	0	1
Music	0.2	0.4	0	1
Reading	0.1	0.3	0	1
Travel	0.05	0.2	0	1
Volunteering	0.02	0.1	0	1
Charitable	0.01	0.05	0	1
Philanthropy	0.005	0.02	0	1
Activism	0.002	0.01	0	1
Leadership	0.001	0.005	0	1
Influence	0.0005	0.002	0	1
Power	0.0001	0.0005	0	1
Control	0.00005	0.0002	0	1
Authority	0.00001	0.00005	0	1
Domination	0.000005	0.00002	0	1
Supremacy	0.000001	0.000005	0	1
Heavenly	0.0000005	0.000002	0	1
Divine	0.0000001	0.0000005	0	1
Sacred	0.00000005	0.0000002	0	1
Holy	0.00000001	0.00000005	0	1
Blessed	0.000000005	0.00000002	0	1
Consecrated	0.000000001	0.000000005	0	1
Sanctified	0.0000000005	0.000000002	0	1
Exalted	0.0000000001	0.0000000005	0	1
Ennobled	0.00000000005	0.0000000002	0	1
Elevated	0.00000000001	0.00000000005	0	1
Exalted	0.000000000005	0.00000000002	0	1
Sublimed	0.000000000001	0.000000000005	0	1
Transcended	0.0000000000005	0.000000000002	0	1
Ascended	0.0000000000001	0.0000000000005	0	1
Elevated	0.00000000000005	0.0000000000002	0	1
Exalted	0.00000000000001	0.00000000000005	0	1
Sublimed	0.000000000000005	0.00000000000002	0	1
Transcended	0.000000000000001	0.000000000000005	0	1
Ascended	0.0000000000000005	0.000000000000002	0	1
Elevated	0.0000000000000001	0.0000000000000005	0	1
Exalted	0.00000000000000005	0.0000000000000002	0	1
Sublimed	0.00000000000000001	0.00000000000000005	0	1
Transcended	0.000000000000000005	0.00000000000000002	0	1
Ascended	0.000000000000000001	0.000000000000000005	0	1
Elevated	0.0000000000000000005	0.000000000000000002	0	1
Exalted	0.0000000000000000001	0.0000000000000000005	0	1
Sublimed	0.00000000000000000005	0.0000000000000000002	0	1
Transcended	0.00000000000000000001	0.00000000000000000005	0	1
Ascended	0.000000000000000000005	0.00000000000000000002	0	1
Elevated	0.000000000000000000001	0.000000000000000000005	0	1
Exalted	0.0000000000000000000005	0.000000000000000000002	0	1
Sublimed	0.0000000000000000000001	0.0000000000000000000005	0	1
Transcended	0.00000000000000000000005	0.0000000000000000000002	0	1
Ascended	0.0000			

[illegible]

13. A method as set forth in claim 11 including the step of determining confidence in the portion of the verification information that correlates with the program requirement if the condition by which the verification information is generated is known.

14. A method as set forth in claim 13
including the step of performing a computer-aided
engineering analysis of the verification information
5 if not confident in the verification information.

15. A method as set forth in claim 14
including the step of using the portion of the
verification information and the results of the
10 computer-aided engineering analysis in the design of
the vehicle if confident in the computer-aided
engineering analysis.

16. A method as set forth in claim 13
15 including the step of using the portion of the
verification information in the design of the vehicle
if confident in the verification information.

5

A method of integrating product information management with vehicle design includes the steps of selecting a vehicle program requirement from a library stored in a memory of a computer system, wherein the library is accessed through an information portal on the computer system. The method also includes the steps of selecting an information database containing information related to the design of the vehicle from the library, wherein the information database is accessed through the information portal, and determining if the information from the information database correlates with the program requirement. The method further includes the steps of using the information from the information database in the design of the vehicle, if the information from the information database correlates with the program requirement.

006220-6592E960

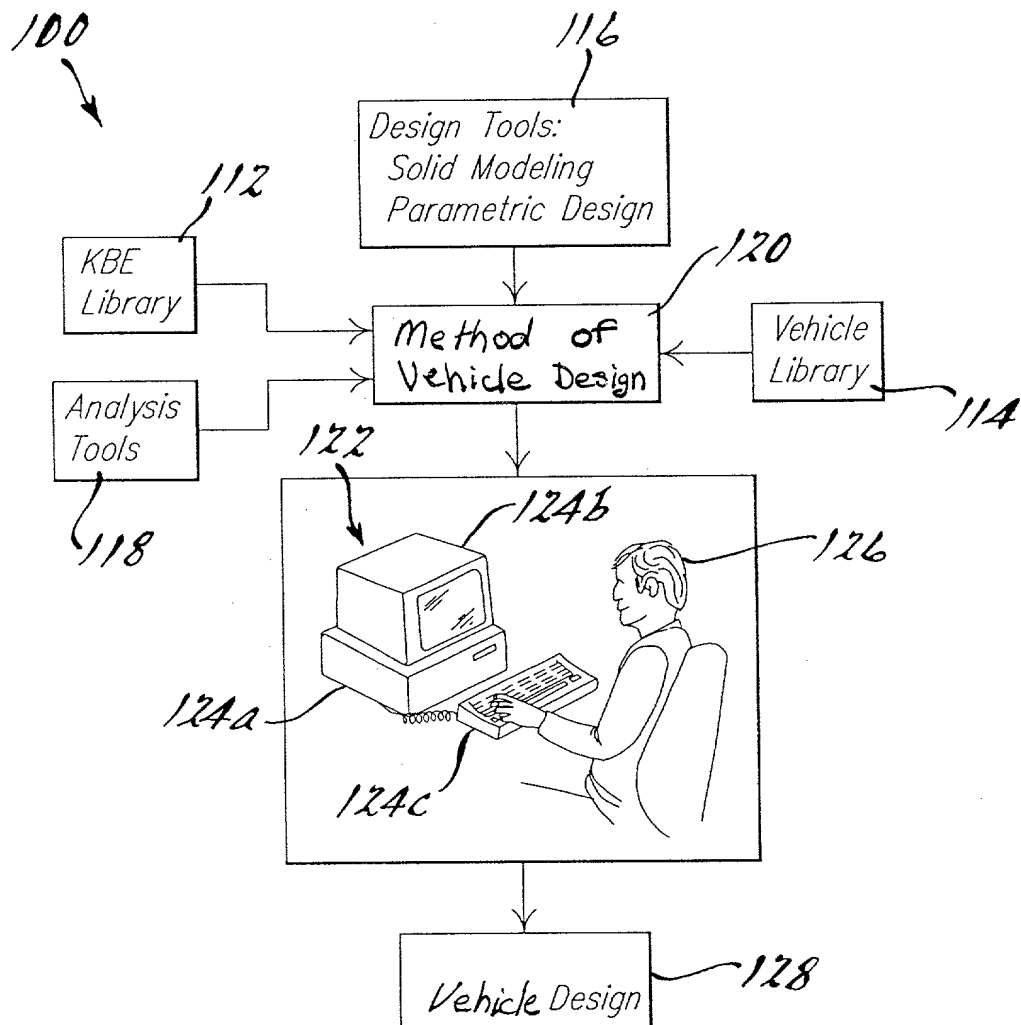
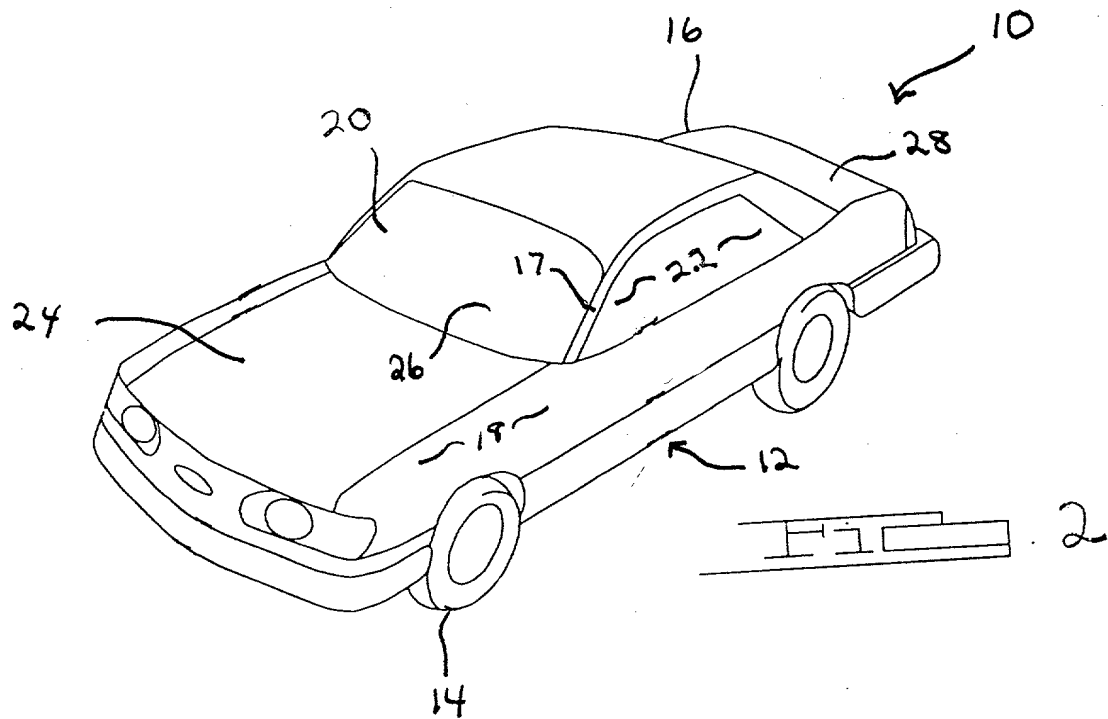


FIG. 1.

005280-6592550



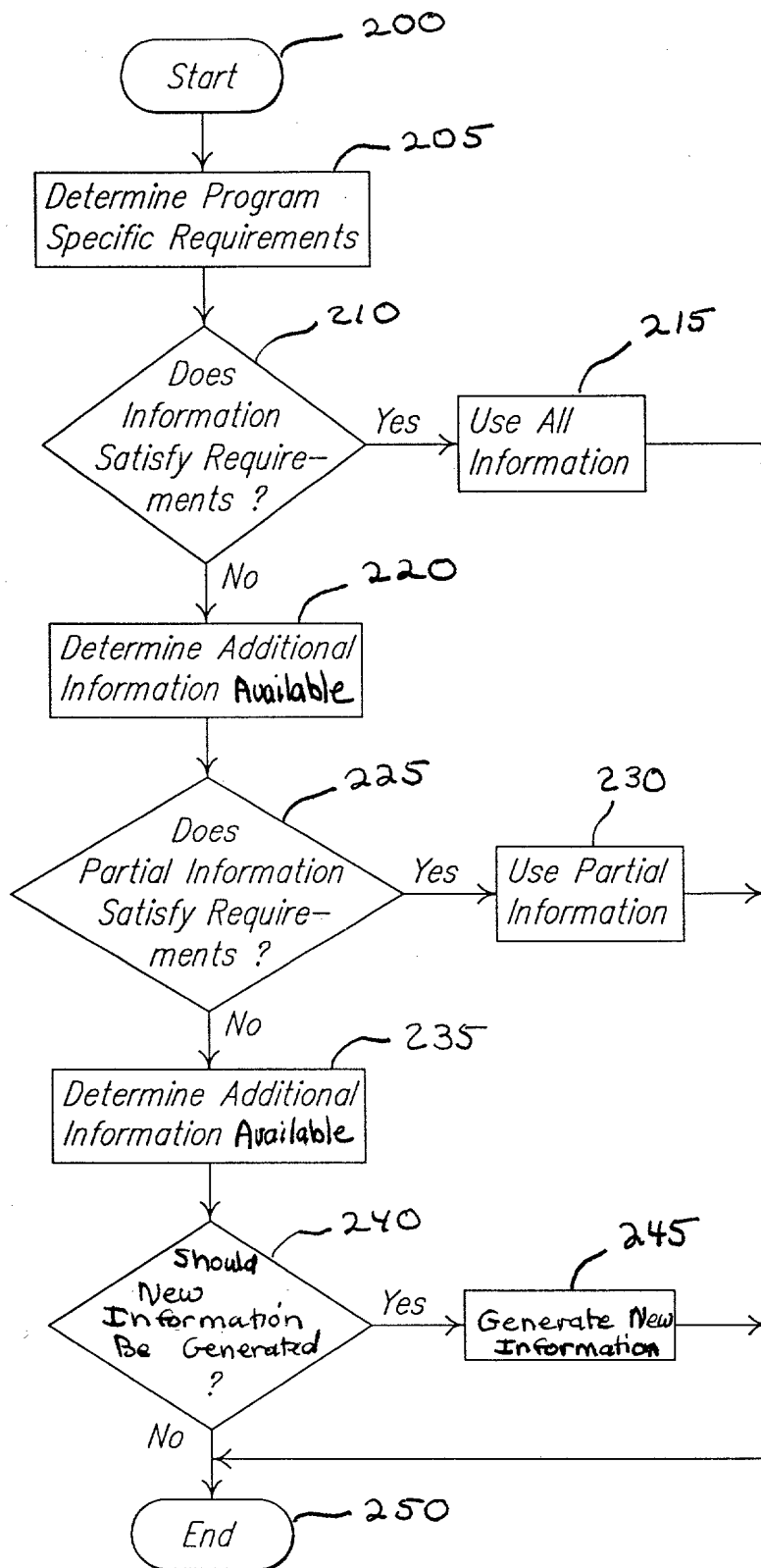


FIG. 3

DECLARATION AND POWER OF ATTORNEY - ORIGINAL APPLICATION

Attorney's Docket No.
199-1255

As a below named inventor, I hereby declare:

My residence, post office address and citizenship are as stated below next to my name;

I verily believe I am the original, first and sole inventor or an original, first and joint inventor of the subject matter that is claimed and for which a patent is sought on the invention entitled

METHOD OF INTEGRATING PRODUCT INFORMATION MANAGEMENT WITH VEHICLE DESIGN

the specification of which is attached hereto.

I have reviewed and understand the contents of the specification identified above, including the claims.

I acknowledge my duty to disclose information of which I am aware that is material to the examination of this application in accordance with Section 1.56(a), Title 37 of the Code of Federal Regulations; and

as to application for patents or inventor's certificate on the invention filed in any country foreign to the United States of America, prior to this application by me or my legal representatives or assigns,

- ☒ no such applications have been filed, or
- ☐ such applications have been filed as follows

COUNTRY	APPLICATION NO.	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s) or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the United States Patent and Trademark Office connected therewith and to act on my behalf before the competent International Authorities in connection with any and all international applications filed by me.
(List name and registration number)

Daniel H. Bliss - 32,398

David B. Kelley - 33,718

Roger L. May - 26,406




CAROL FREITAG
2 PAGES

2-7162

Address all correspondence and telephone calls to:

Daniel H. Bliss
Bliss McGlynn P.C.
2075 West Big Beaver Road Suite 600
Troy, MI 48084 Phone: 248 - 649-6090

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

NAME AND POST OFFICE ADDRESS OF INVENTOR:	RESIDENCE	CITIZENSHIP	SIGNATURE	DATE
Krishna Murthy 28696 Roxbury Farmington Hills, MI 48331 US	Farmington Hills, MI 48331 US	U.S.A		3/27/00
Michael E. Stoeckle 46525 Creekside Canton, MI 48187 US	Canton, MI 48187 US	U.S.A		03/27/00
Devang Desai 29289 Glen Oaks Blvd. E. Farmington Hills, MI, 48334	Farmington Hills, 48324 US	India		3/27/00

00620-6592560